Distributed Virtual SAN Infrastructure

Console host

Management console — **14**

— **10**

11

IP SAN unit (spare) — **13**

Service modules

4

IP SAN unit

Service modules

IP SAN unit

Service modules

IP SAN unit

Service modules

Fibre channel IP
SAN unit

Service modules

6

network infrastructure, **2**

Network infrastructure, **1**

Fibre Channel
to IP Gateway

5

Distribute Control
Management Station **3**

control mgmt
modules

7

Console support
software modules

8

Web server module

15

mgmt console — **10**

Host (1)

service
modules

Host (2)

service
modules

Host (n)

service
modules

9

Spare host

Service
modules

12

Fig. 1

The Actual Components of Distributed Virtual SAN

11

IP SAN Unit
> service modules

4

management
console

14

10

IP SAN Unit
> service module

Net infrastructure

2

IP SAN Unit
> service module

Fibre Channel
to IP Gateway

**Distribute Control
Management
Station**

3

Control Mgmt
software modules

7

Console support
software

8

Mgmt console

5

Fibre Channel SAN unit
> service module

6
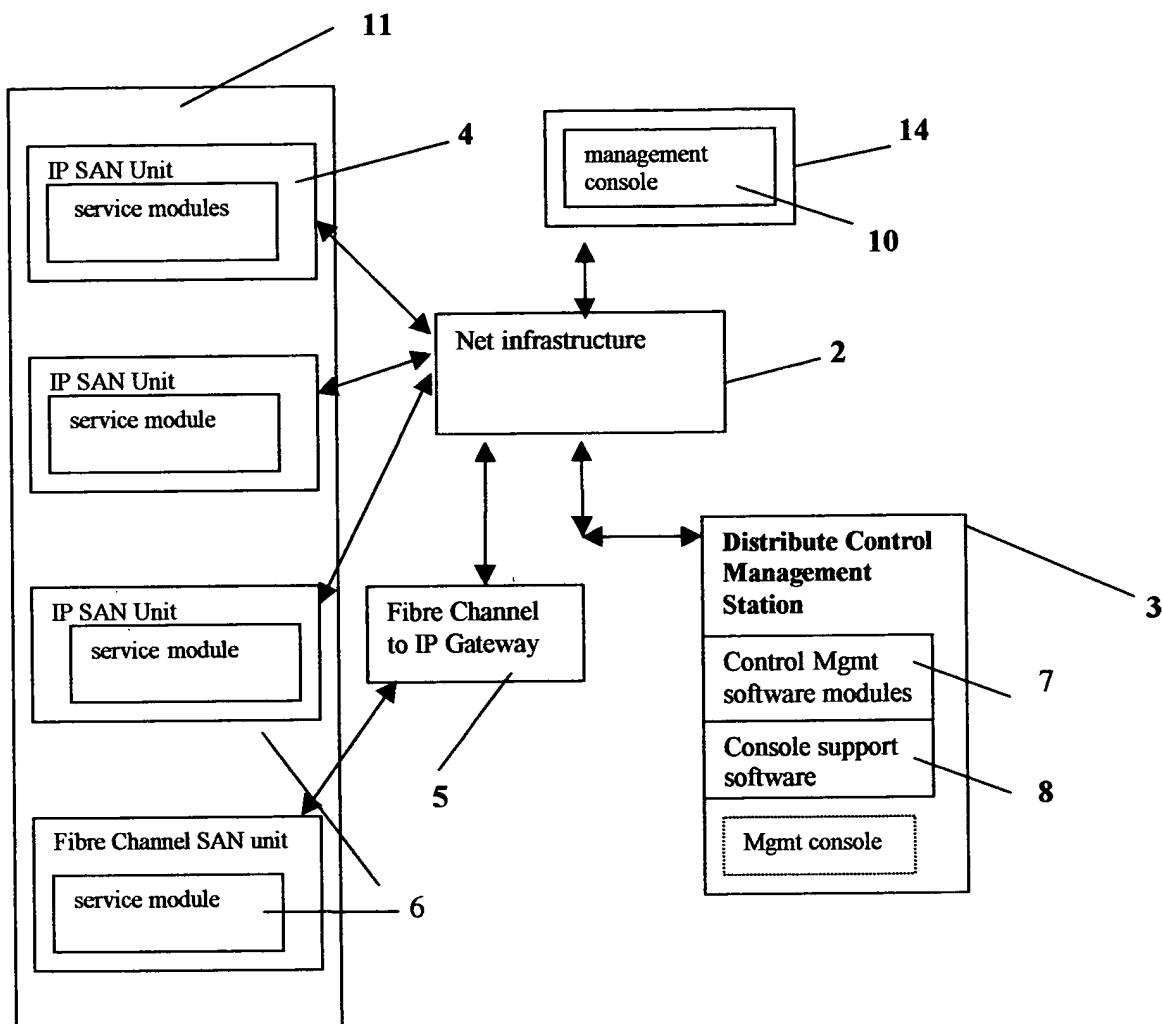
Fig. 2

Virtual SAN Storage Pool Automatic Configuration Protocol

IP SAN Unit (4)   **distribute Control Management Station (3)**

Send "Unit (n) Start Up"

⬭   Receive "Unit (n) Start Up"

⬤

Send "need unit(n) storage info"

Receive "need unit (n) storage info"

⬭

Send "unit (n) storage info"

⬤ Receive "unit (n) storage info"

IP SAN Unit   **distribute Control Management Station**

Send "unit (n) shutdown"

⬭   Receive "unit (n) shutdown"

⬤
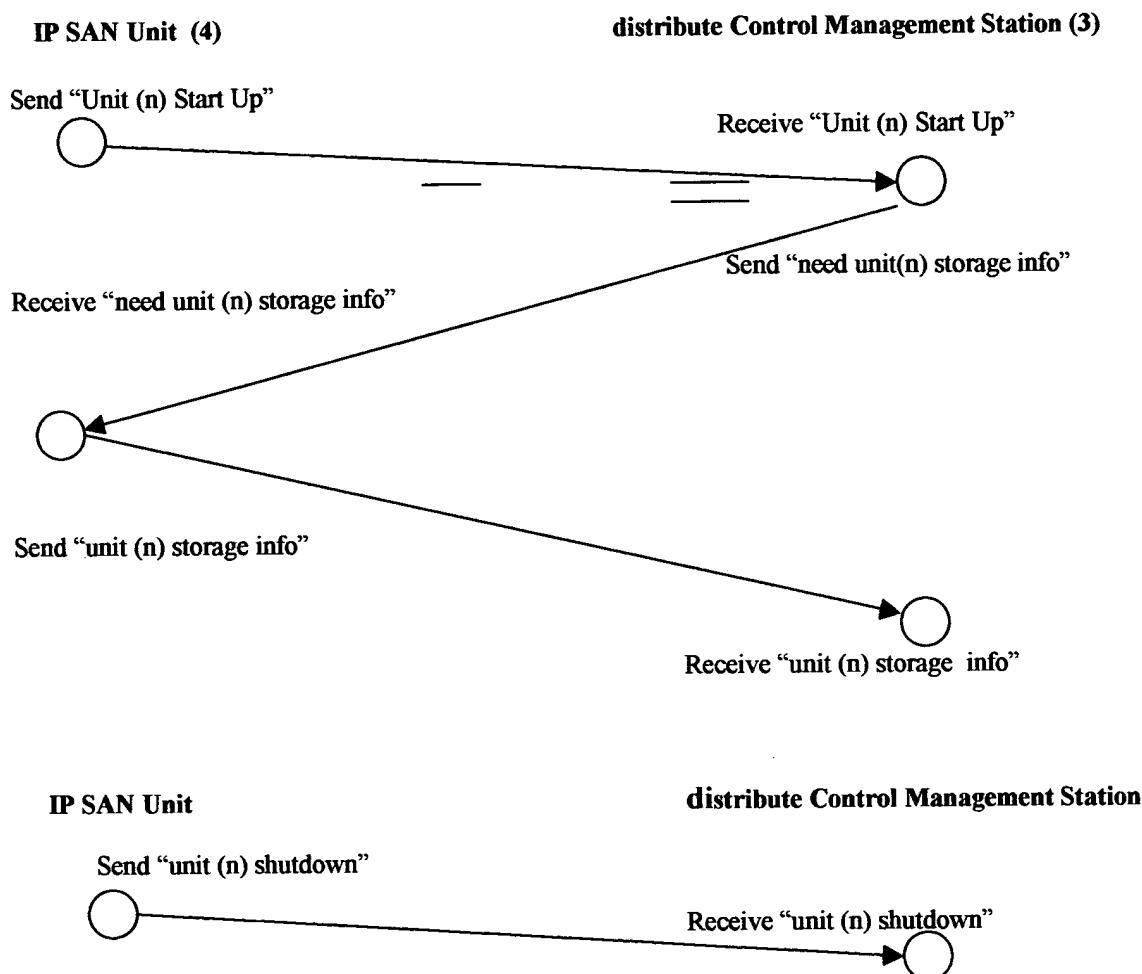
Fig. 3

The UDP packet format used by "Virtual SAN Auto Configuration Protocol"

| Source IP address |
|---|
| Destination IP address |
| Source port |
| Destination port |
| Message Type |
| Data Length |
| Data Area |
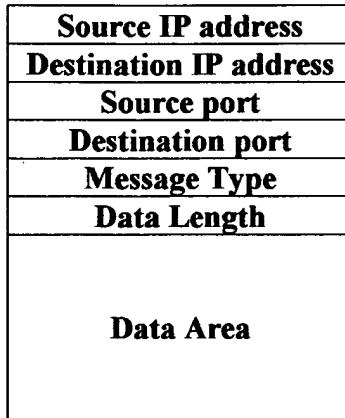
Fig. 4

**Example of Storage Volume Information of an IP SAN Unit**

IP SAN Unit

| Volume 1			
P1	P2	P3	P3
Volume 2			
Volume 3			
Volume 4			
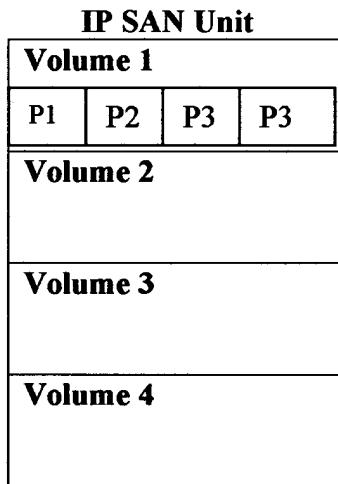
Note: Each volume may further be partitioned into small chunk of partition.

Fig. 5

A Hypothetical Example of Storage Volume Requests and Assignments

IP SAN Unit (1)	Volume 1 50GB
	Volume 2 50GB
	Volume 3 60GB
	Volume 4 40GB

IP SAN Unit (2)	Volume 1 100GB
	Volume 2 100GB
	Volume 3 100GB

| IP SAN Unit (M) | Volume 1 200 GB |
| | Volume 2 80 GB |

Host (1)

Host (2)
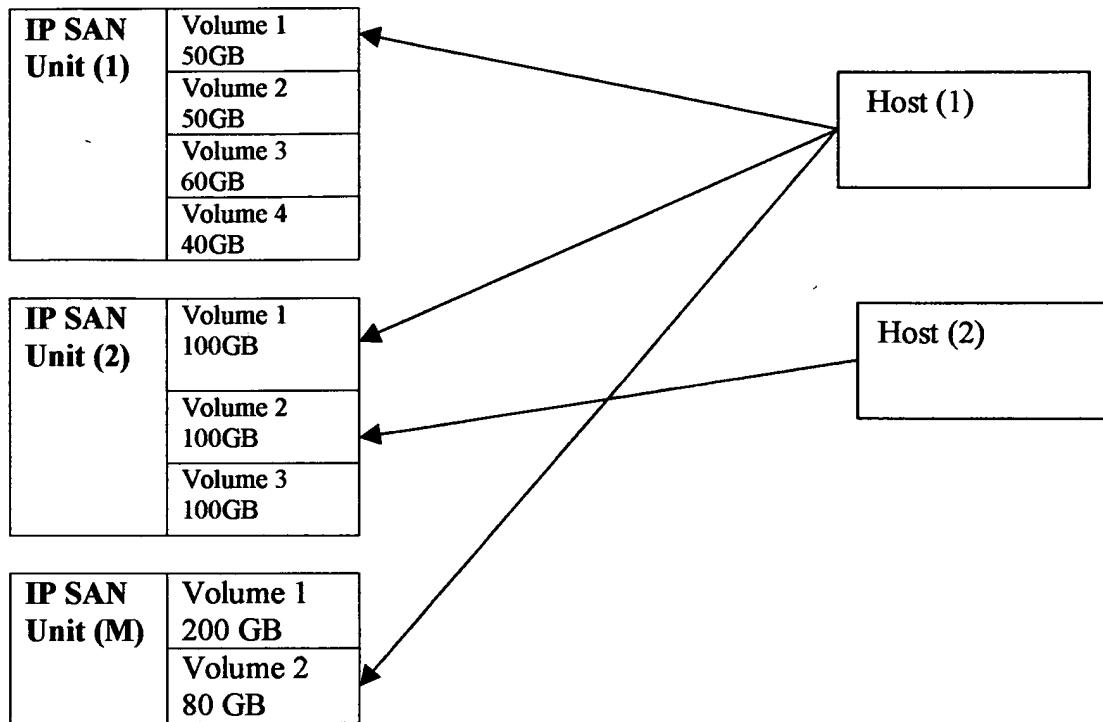
Fig. 6

Direct Attached Storage System:
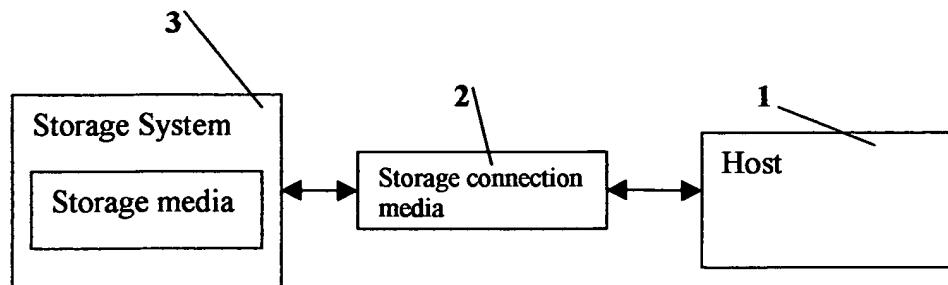
Fig. 7

In-Band Accessed Virtual SAN
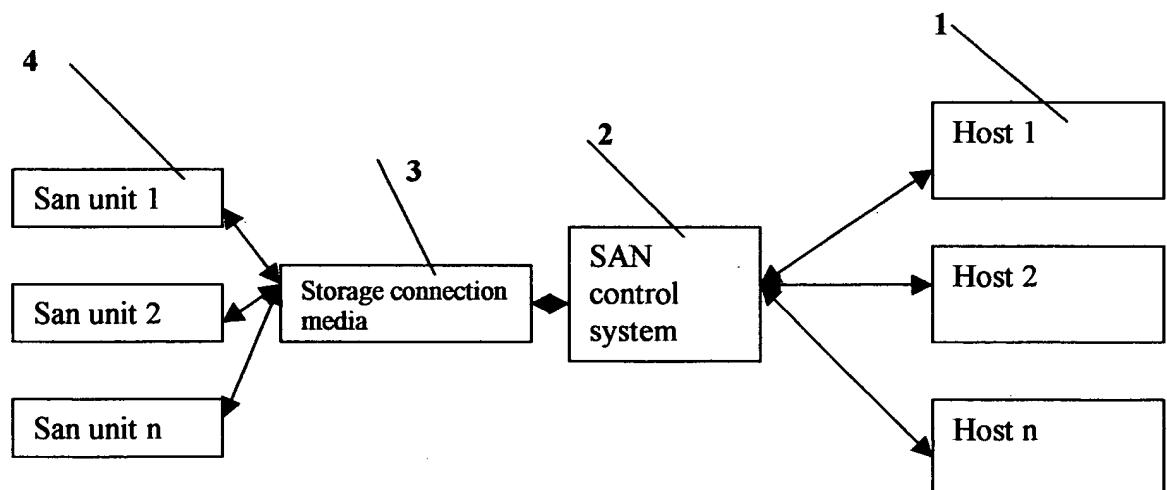
Fig. 8

Central Controlled Distributed Scalable Virtual Machine Infrastructure
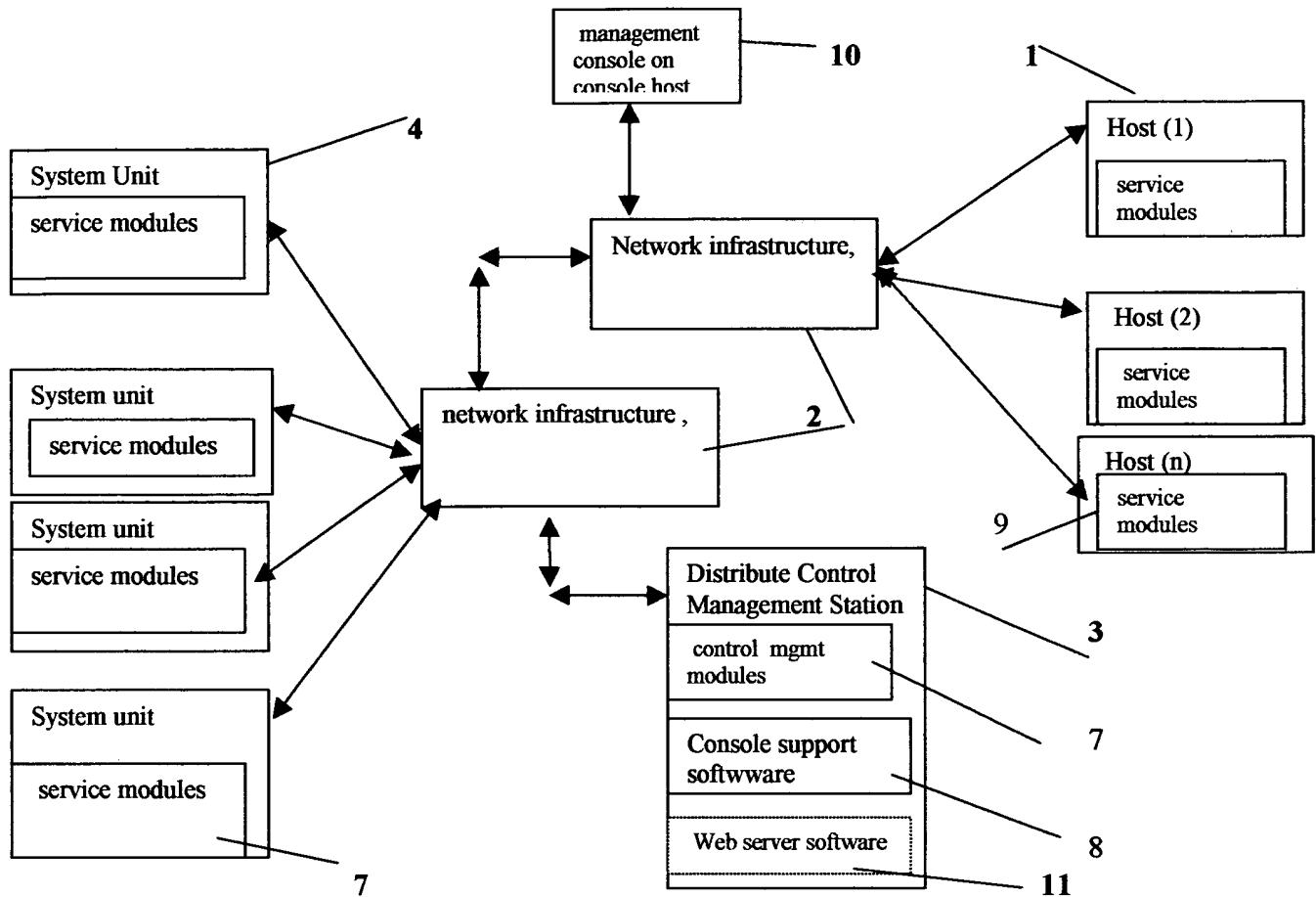
Fig. 9

Recovery Scheme of the Distributed Virtual SAN Infrastructure

IP SAN unit 1

IP SAN unit 2

IP SAN unit 3
(spare)

3

IP SAN unit 4

IP SAN unit 5

Host 1

Host 2 (spare)

Host 3

1

Network Infrastructure 2

Fig. 10